AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A base station, servicing a macrocell and at least one microcell, comprising:

at least one steerable N-dimensional (N≥2) antenna array within the macrocell for serving the microcell and co-located with ~~an~~ a macrocell antenna of said base station, the steerable N-dimensional antenna array ~~for serving the microcell within the macrocell, the base station being in the macrocell but not the microcell~~including at least two antenna elements and an N-dimensional digital filter for receiving inputs from said at least two antenna elements and processing the inputs to produce a resultant output beam,

wherein at least one of the inputs and outputs are weighted using filter tap weighting coefficients of a plurality of filter taps to steer the resultant output beam, and

wherein the weighting coefficients of a given filter tap are determined as a function of an antenna element spacing value between antenna elements, a look direction of the resultant output beam and a wavelength of an incident signal.

2. (Original) The base station of claim 1, wherein said at least one steerable N-dimensional array serving the microcell is co-located on an antenna tower with the antenna serving the macrocell.

3. (Original) The base station of claim 1, wherein the microcell includes a hot spot.

4. (Original) The base station of claim 1, wherein said base station includes a steerable N-dimensional (N≥2) array for each microcell within the macrocell.

5-7 (Canceled)

8. (Original) The base station of claim 1, wherein said at least one steerable N-dimensional (N≥2) array serves a hot spot.

9. (Currently Amended) The base station of claim ~~6~~1, wherein an angular spread and the look direction of the resultant output beam ~~of said at least one steerable N-dimensional array~~ are varied by varying a number of the plurality of filter taps.

10. (Currently Amended) The base station of claim ~~5~~1, wherein said at least two antenna elements are arranged in a two-dimensional plane or on a surface of a cylinder.

11. (Currently Amended) The base station of claim 9, wherein the weighting coefficients for a given filter tap are complex coefficients, w_j, ~~for the filter taps are given~~ determined by: $w_j = \cos\left[2\pi \frac{Kd}{\lambda} \sin\theta\right] - i \cdot \sin\left[2\pi \frac{Kd}{\lambda} \sin\theta\right]$

where k= the filter tap,

d= antenna element spacing,

θ= look direction of the resultant output beam, and

λ= wavelength of an incident signal.

12. (Original) The base station of claim 1, wherein said base station is part of a TDMA system and the macrocell and the microcell are separated in the frequency domain.

13. (Original) The base station of claim 1, wherein said base station is part of a CDMA system and the macrocell and the microcell are separated in one of the frequency and the code domains.

14. (Currently Amended) A method of servicing at least one microcell in a macrocell, the at least one microcell and the macrocell supported by a base station, comprising:

co-locating, with ~~an~~ a macrocell antenna at the base station, at least one steerable N-dimensional (N≥2) antenna array within the microcell, the N-dimensional antenna array having at least two antenna elements and an N-dimensional digital filter;

receiving inputs from said at least two antenna elements at said N-dimensional digital filter;

processing the inputs at said N-dimensional digital filter to produce a resultant output beam~~, the N-dimensional array~~ for serving the microcell; and

steering ~~a~~ the resultant output beam ~~of the at least one steerable N-dimensional (N≥2) array~~ toward the at least one microcell, ~~the microcell being within the macrocell, the base station being in the macrocell but not the microcell.~~

wherein steering further includes using filter tap weighting coefficients to weight at least one of the inputs and outputs to steer the resultant output beam, and

wherein the weighting coefficients of a given filter tap determined as a function of an antenna element spacing value between antenna elements, a look direction of the resultant output beam and a wavelength of an incident signal.

15. (Original) The method of claim 14, wherein said at least one steerable N-dimensional array serving the microcell is co-located on an antenna tower with the antenna serving the macrocell.

16. (Original) The method of claim 14, wherein the microcell includes a hot spot.

17. (Original) The method of claim 14, wherein said co-locating step includes co-locating a steerable N-dimensional (N≥2) array with the base station for each microcell within the macrocell.

18-20 (Canceled)

21. (Original) The method of claim 14, wherein the at least one steerable N-dimensional array serves a hot spot.

22. (Currently Amended) The method of claim ~~19~~14, further comprising varying a number of said plurality of filter taps of the resultant output beam ~~of the at least one steerable N-dimensional array~~ to vary an angular spread and the look direction of the resultant output beam.

23. (Currently Amended) The method of claim ~~18~~14, further comprising arranging the at least two antenna elements in a two-dimensional plane or on a surface of a cylinder.

24. (Currently Amended) The method of claim 22, the weighting coefficients for a given filter tap are complex coefficients, w_j, determined by ~~wherein complex coefficients for the number of filter taps are given by~~:

$$w_j = \cos\left[2\pi\frac{Kd}{\lambda}\sin\theta\right] - i\cdot\sin\left[2\pi\frac{Kd}{\lambda}\sin\theta\right]$$

where k= the filter tap,

d= antenna element spacing,

θ= look direction of the resultant output beam, and

λ= wavelength of an incident signal.

25. (Original) The method of claim 14, wherein the base station is part of a TDMA system and the macrocell and the microcell are separated in the frequency domain.

26. (Original) The method of claim 14, wherein the base station is part of a CDMA system and the macrocell and the microcell are separated in one of the frequency and the code domains.

27-39. (Canceled)